

CLAIMS

1. A data processing method for processing so that
a portable device mounting an integrated circuit storing
5 key data for dividing and first area management key data
which is authorized to perform at least one of a write
operation of data to a memory area of said integrated
circuit and a rewrite operation of data to the memory
area on the condition that the first area management key
10 data is used makes a second service provider provide a
service using part of said memory area of said integrated
circuit when said portable device is issued by a first
service provider providing a service using said memory
area,
- 15 said data processing method comprising the
steps of:
- having a memory area operation unit managing
said key data for dividing encrypt first module data
including second area management key data by the key data
20 for dividing and provide the same to the first service
provider;
- having the issuer of the portable device which
is said first service provider, encrypt second module
data including the encrypted first module by using said
25 first area management key data and provide the same to

said memory area operation unit; and,

under the control of the memory area operation unit, providing the encrypted second module data to the integrated circuit, decrypting the second module data by
5 using the first area management key data in the integrated circuit, decrypting the first module data in the decrypted second module by using the key data for dividing, and dividing the memory area to a first memory area to be used for service of the first service provider
10 and a second memory area to be used for service of the second service provider by using the second area management key data obtained by the decrypting.

2. A data processing method as set forth in claim 1, further comprising the step of having the integrated
15 circuit divide the memory area into the first memory area wherein at least one of a write operation of data and a rewrite operation of data is authorized on the condition that the first area management key data is used and the second memory area wherein at least one of a write
20 operation of data and a rewrite operation of data is authorized on the condition that the second area management key data is used.

3. A data processing method as set forth in claim 1, further comprising:
25 having the integrated circuit further store

first system key data and authorize at least one of a
write operation of data to the memory area and a rewrite
operation of data in the memory area on the condition the
first system key data and the first area management key
5 data are used;

having the memory area operation unit encrypt
first module data further including second system key
data by the key data for dividing and provide the same to
the first service provider;

10 having the first service provider encrypt
second module data including the encrypted first module
and division condition information indicating the
condition for dividing the memory area for use by another
service provider by using the first area management key
15 data and provide it to the memory area operation unit;
and

having the integrated circuit decrypt the
second module data by using the first area management key
data, decrypt the first module data in the decrypted
20 second module by using the key data for dividing, and
divide the memory area by using the second system key
data, second area management key data, and division
condition information obtained by the decrypting.

4. A data processing method as set forth in claim
25 1, further comprising

providing a memory area division apparatus for
dividing said memory area to said second service provider
under the control of said memory area operation unit and

having said memory area division apparatus
5 provide said encrypted second module data to said
integrated circuit.

5. A data processing method as set forth in claim
2, when a plurality of third memory areas can be defined
in said second memory area and third area management key
10 data used for performing at least one of a write
operation of data to the third memory area and a rewrite
operation of data in the third memory area is defined for
each of said plurality of third memory areas,

further comprising the steps of having
15 said memory area operation unit encrypt third
area management key data by second area management key
data and provide the same to said memory area division
apparatus;

having said memory area division apparatus
20 provide said encrypted third area management key data to
said integrated circuit; and

having said integrated circuit decrypt said
encrypted third area management key data by using said
second area management key data, establish correspondence
25 with said third memory areas defined in said second

memory area to store said third area management key data obtained by said decrypting.

6. A data processing method as set forth in claim 5, further comprising the step:

5 having said memory area operation unit assign a service code for identifying a service provided by using the third memory area for each of said third memory areas and generate and store an area code list indicating an area code for identifying said third memory area, said
10 third area management key data corresponding to the third memory area, and said service code assigned to the third memory area in correspondence.

7. A data processing method as set forth in claim 3, further comprising the steps of:

15 providing a memory area division apparatus for dividing said memory area to said second service provider under the control of said memory area operation unit;

 having said memory area division apparatus provide said encrypted second module data to said
20 integrated circuit;

 having said memory area operation unit provide first degenerate key data obtained by encrypting by using said second system key data and said second area management key data to said memory area division
25 apparatus;

having said integrated circuit generate second degenerate key data by encrypting by using said second system key data obtained by decrypting and said second area management key data; and

5 performing mutual authentication between said memory area division apparatus and said integrated circuit by using said first degenerate key data and said second degenerate key data.

8. A data processing method as set forth in claim
10 6, further comprising the steps of:

having said memory area operation unit
provide an operation file registration
apparatus to said second service provider,

provide said third area management key data to
15 said operation file registration apparatus, and

establish correspondence between said service
code in said area code list and said area code to provide
the same to said operation file registration apparatus;

having said operation file registration
20 apparatus store file registration permission data
indicating said service code and file management key data
issued by said second service provider in correspondence,
encrypt said file registration permission data by using
said third area management key data, and provide the same
25 to said integrated circuit; and

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having said integrated circuit decrypt said
file registration permission data by using said third
area management key data and write file data relating to
a service of said second service provider to said third
5 memory area by using said file management key data in
said decrypted file registration permission data.

9. A data processing method as set forth in claim
4, further comprising the steps of,

when there are a plurality of said first
10 service providers, and said first system management key
data and a system code for identifying said first service
provider are added to each of said plurality of first
service providers,

having said memory area operation unit
15 receive rejection information for specifying a
party for which provision of services from respective
service providers by using the same integrated circuit is
rejected from said first service provider and said second
service provider,

20 generate a registerable system code list
indicating said system code added to said first service
provider capable of providing a service by said same
integrated circuit as said second service provider based
on said rejection information, and

25 provide the registerable system code list to

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said memory area division apparatus; and

having said memory area division apparatus
judge whether or not to divide said memory area of the
integrated circuit based on said system code stored in
5 the integrated circuit and said registerable system code
list before dividing said memory area of said integrated
circuit.

10. A data processing method as set forth in claim
1, further comprising the step of having said memory area
10 operation unit pay a fee for using said second memory
area of said integrated circuit to said first service
provider.

11. A data processing method as set forth in claim
1, further comprising the step of having said second
15 service provider pay a fee for using said second memory
area of said integrated circuit to said memory area
operation unit.

12. A data processing method as set forth in claim
1, wherein said portable device is a card.

20 13. A data processing system for processing so that
a portable device mounting an integrated circuit storing
key data for dividing and first area management key data
which is authorized to perform at least one of a write
operation of data to a memory area of said integrated
25 circuit and a rewrite operation of data to the memory

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area on the condition that the first area management key data is used makes a second service provider provide a service using part of said memory area of said integrated circuit when issued by a first service provider providing
5 a service using said memory area, wherein the system has

a memory area operation processing apparatus used by a memory area operation unit which manages the key data for dividing,

a first service provider processing apparatus
10 used by the issuer of the portable device which is the first service provider, and

a second service provider processing apparatus used by the first service provider;

wherein:

15 the memory area operation processing apparatus encrypts first module data including second area management key data by the key data for dividing and sends the same to the first service provider processing apparatus;

20 the first service provider processing apparatus encrypts second module data including the received encrypted first module by using the first area management key data and sends the same to the memory area operation processing apparatus;

25 the memory area operation processing apparatus

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provides the received encrypted second module data to the integrated circuit; and

the integrated circuit decrypts the second module data by using the first area management key data, decrypts the first module data in the decrypted second module by using the key data for dividing, and divides the memory area to a first memory area to be used for service of the first service provider and a second memory area to be used for service of the second service provider by using the second area management key data obtained by the decrypting under control of the memory area operation unit.

14. A data processing system as set forth in claim 13, wherein said integrated circuit divides said memory area to said first memory area wherein at least one of a write operation of data and a rewrite operation of data is authorized on the condition that said first area management key data and said second memory area are used wherein at least one of a write operation of data and a rewrite operation of data is authorized on the condition that said second area management key data is used.

15. A data processing system as set forth in claim 13, wherein:

said integrated circuit further stores first system key data and authorizes at least one of a write

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operation of data to said memory area and a rewrite operation of data in the memory area on the condition that said first system key data and said first area management key data are used;

5 said memory area operation processing apparatus encrypts first module data further including second system key data by said key data for dividing and provides the same to a first service provider processing apparatus;

10 said first service provider processing apparatus encrypts second module data including said encrypted first module and division condition information indicating conditions of dividing said memory area for use of other service providers and provides it to said
15 memory area operation unit processing apparatus; and

 said integrated circuit decrypts said second module data by using said first area management key data, decrypts said first module data in the decrypted second module by using said key data for dividing, and divides
20 said memory area by using said second system key data, second area management key data, and said division condition information obtained by the decrypting.

16. A portable device mounting an integrated circuit used for a first service provider providing a
25 service, wherein the integrated circuit comprises:

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a memory means for storing key data for
dividing managed by a memory area operation unit
performing processing to make a second service provider
provide a service using a part of a memory area of the
5 integrated circuit and first area management key data;

an input means for inputting a module including
second area management key data issued by the memory area
operation unit which is encrypted by the memory area
operation unit by using the key data for dividing and
10 furthermore encrypted by the first service provider by
using the first area management key data; and

a processing means for decrypting the input
module by using the key data for dividing and the first
area management key data, dividing a memory area of the
15 memory means to a first memory area and a second memory
area by using the second area management key data in the
decrypted module, authorizing at least one of a write
operation of data to the first memory area and a rewrite
operation of data in the memory area on the condition
20 that the first area management key data is used and
authorizing at least one of a write operation of data to
the second memory area and a rewrite operation of data in
the memory area on the condition that the second area
management key data is used.

25 17. A portable device as set forth in claim 16,

5 authorizes a write operation of a file used for
 processing of the processing means in said second memory
 area on the condition that said second area management
 key data is used.

10 **wherein:**

key data;

further including second system key data; and

15 said processing means uses said second system
key data and said second area management key data in said
decrypted module to divide the memory area of said memory
means to said first memory area and said second memory
area, authorizes at least one of a write operation of
20 data to said first memory area or a rewrite operation of
data in the memory area on the condition that said first
system key data and said first area management key data
are used, and authorizes at least one of a write
operation of data to said second memory area or a rewrite
25 operation of data in the memory area on the condition

that said second system key data and said second area management key data are used.

19. A data processing apparatus for processing so that a portable device mounting an integrated circuit storing distribution key data, a system code for identifying a first service provider, and first area management key data which is authorized to perform at least one of a write operation of data to a memory area of said integrated circuit and a rewrite operation of data to the memory area on the condition that the first area management key data is used makes a second service provider provide a service using part of said memory area of said integrated circuit when issued by a first service provider providing a first service using said memory area, wherein

the apparatus has a memory means, processing means, and input/output means;

the memory means stores rejection information for specifying a service provider which can provide service by the same integrated circuit indicated by the first service provider and the second service provider;

the processing means encrypts a first module including second management key data by using the key data for dividing;

the input/output means outputs the encrypted

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first module to provide it to the first service provider,
receives as input a second module including the encrypted
first module and encrypted in the first service provider
by using the first area management key data, and outputs
5 the second module to provide it to a memory area division
apparatus for dividing the memory area under control of
the second service provider so that a part of the memory
area of the integrated circuit can be used by the second
service provider;

10 the processing means generates a registerable
system code list indicating the system code added to the
first service provider which can provide service by the
same integrated circuit as the second service provider
based on the rejection information; and

15 the input/output means outputs the system code
list to provide it to the memory area division apparatus.

20. A data processing apparatus as set forth in
claim 19, wherein

when said memory area division apparatus
20 divides said memory area of said integrated circuit to
said first memory area wherein at least one of a write
operation of data and a rewrite operation of data is
authorized on the condition that said first area
management key data is used and said second memory area
25 wherein at least one of a write operation of data and a

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rewrite operation of data is authorized on the condition that said second area management key data is used;

said processing means defines a plurality of memory areas in said second memory area, issues third
5 area management key data used for performing at least one of a write operation of data to the third memory area and a rewrite operation of data in said third memory area for each of said plurality of third memory areas and encrypts the third area management key data by said second area
10 management key data; and

said input/output means outputs said encrypted third area management key data to provide it to said memory area division apparatus.

21. A data processing apparatus as set forth in
15 claim 20, wherein said processing means issues a service code for identifying a service provided by using the third memory area for each of said third memory areas and generates an area code list indicating an area code for identifying said third memory areas, said third area
20 management data corresponding to the third memory area, and said service code assigned to the third memory area in correspondence; and

said memory means stores said area code list.

22. A data processing apparatus as set forth in
25 claim 21, wherein said input/output means establishes

correspondence between said area code included in said
area code list and said service code and outputs the same
to provide it to a file registration apparatus for
writing file data used for a service of said second
5 service provider in said third memory area of said
integrated circuit.

23. A data processing apparatus for processing so
that a portable device mounting an integrated circuit
storing distribution key data, a system code for
10 identifying a first service provider, and first area
management key data which is authorized to perform at
least one of a write operation of data to a memory area
of said integrated circuit and a rewrite operation of
data to the memory area on the condition that the first
15 area management key data is used makes a second service
provider provide a service using part of said memory area
of said integrated circuit when issued by a first service
provider providing a first service using said memory
area, wherein

20 the apparatus has a memory means, input/output
means, and processing means;

the memory means stores a module including
second area management key data issued by a memory area
operation unit for managing processing of the data
25 processing apparatus and encrypted by the memory area

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operation unit by using the key data for dividing and a registerable system code list indicating the system code added to the first service provider which can provide service by the same integrated circuit as the second
5 service provider;

the input/output means receives as input the system code from the integrated circuit; and

the processing means outputs the module to the integrated circuit via the input/output means when it
10 judges that the input system code is indicated in the registerable system code list.

24. A data processing apparatus for performing processing to write file data in a second memory area of an integrated circuit having a first memory area wherein
15 at least one of a write operation and rewrite operation of file data used for providing a first service is authorized on the condition that first area management key data is used and a second memory area wherein at least one of a write operation and rewrite operation of
20 file data used for providing a second service is authorized on the condition that second area management key data is used,

when a plurality of third memory areas are defined in the second memory area, third memory
25 management key data used for performing at least one of a

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write operation of data to a third memory area and a
rewrite operation of data in the third memory area is
defined for each of the plurality of third memory areas,
and said integrated circuit stores said third area

5 management key data; comprising,

said data processing apparatus, comprising:

a memory means storing third area management
data and file key data which is issued by the second
service provider, used at the time of writing the file
10 data to a third memory area, and encrypted by the third
area management key data;

an output means for outputting the encrypted
file key data to the integrated circuit; and

a writing means for writing file data to be
15 used for providing the second service to the second
memory area of the integrated circuit by using the file
key data.

25. A portable unit issuing method comprising the
steps of:

20 issuing a portable unit mounting an integrated
circuit storing key data for dividing and first area
management key data and authorizing at least one of a
write operation of data to a memory area in said
integrated circuit and a rewrite operation of data in the
25 memory area on the condition that the first area

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management key data is used and

requesting a memory area operation unit
managing the key data for dividing to divide the memory
area of the integrated circuit to a first memory area

5 wherein at least one of a write operation of data and re-
write data in the memory area is authorized on the
condition that the first area management key data is used
and a second memory area wherein at least one of a write
operation of data and a rewrite operation of data in the
10 memory area is authorized on the condition that the
second area management key data is used by using the key
data for dividing.

26. A method of issuing a portable unit as set
forth in claim 25, wherein said portable unit is a card.

15 27. A program for making a computer execute
processing so that a portable device mounting an
integrated circuit storing key data for dividing, a
system code for identifying a first service provider, and
first area management key data which is authorized to
20 perform at least one of a write operation of data to a
memory area of said integrated circuit and a rewrite
operation of data to the memory area on the condition
that the first area management key data is used makes a
second service provider provide a service using part of
25 said memory area of said integrated circuit when issued

by a first service provider providing a first service using said memory area, comprising making the computer execute

a routine for receiving as input the system
5 code from the integrated circuit;

a routine for referring to a registerable
system code list indicating the system code given to the
first service provider which can provide a service by the
same integrated circuit as the second service provider
10 and judging whether the input system code is indicated in
the registerable system code list; and

a routine for outputting to the integrated
circuit a module including second area management data
issued by a memory area operation unit managing execution
15 of the program and encrypted by the memory area operation
unit by using the key data for dividing and further
encrypted by the first service provider by using the
first area management key data when judging that the
input system code is indicated in the registerable system
20 code list.

28. A data processing method for processing so that
a portable device mounting an integrated circuit storing
distribution key data, a system code for identifying a
first service provider, and first area management key
25 data which is authorized to perform at least one of a

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write operation of data to a memory area of said
integrated circuit and a rewrite operation of data to the
memory area on the condition that the first area
management key data is used makes a second service
5 provider provide a service using part of said memory area
of said integrated circuit when issued by a first service
provider providing a first service using said memory
area, comprising:

10 a routine of inputting the system code from the
integrated circuit;

20 a routine of referring to a registerable system
code list indicating the system code given to the first
service provider which can provide service by the same
integrated circuit as the second service provider and
15 judging whether the input system code is indicated in the
registerable system code list; and

a routine of outputting to the integrated
circuit a module including second area management data
issued by a memory area operation unit managing execution
20 of the program and encrypted by the memory area operation
unit by using the key data for dividing and further
encrypted by the first service provider by using the
first area management key data when it judges that the
input system code is indicated in the registerable system
25 code list.

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29. A program for making a computer execute
processing for writing file data to a second memory area
of an integrated circuit having a first memory area
wherein at least one of a write operation and rewrite
5 operation of file data used for providing a first service
is authorized on the condition that first area management
key data is used and a second memory area wherein at
least one of a write operation and rewrite operation of
file data used for providing a second service is
10 authorized on the condition that second area management
key data is used, comprising making the computer execute
a routine of outputting to the integrated
circuit file key data which is issued by a second service
provider, used at the time of writing the file data in a
15 third memory area, and encrypted by a third area
management data when a plurality of third memory areas
are defined in the second memory area, a third memory
management key data used for performing at least one of a
write operation of data to a third memory area and a
20 rewrite operation of data in the third memory area is
defined for each of the plurality of third memory areas,
and the integrated circuit stores the third area
management key data and
a routine of writing file data used for
25 providing the second service in the second memory area of

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the integrated circuit by using the file key data.

30. A data processing method for performing processing for writing file data to a second memory area of an integrated circuit having a first memory area
- 5 wherein at least one of a write operation and rewrite operation of file data used for providing a first service is authorized on the condition that first area management key data is used and a second memory area wherein at least one of a write operation and rewrite operation of
- 10 file data used for providing a second service is authorized on the condition that second area management key data is used, comprising
- a routine of outputting to the integrated circuit file key data which is issued by a second service
- 15 provider, used at the time of writing the file data in a third memory area, and encrypted by a third area management data when a plurality of third memory areas are defined in the second memory area, a third memory management key data used for performing at least one of a
- 20 write operation of data to a third memory area and a rewrite operation of data in the third memory area is defined for each of the plurality of third memory areas, and the integrated circuit stores the third area management key data and
- 25 a routine of writing file data used for

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providing the second service in the second memory area of the integrated circuit by using the file key data.

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